WHAT IS CLAIMED:

1. A method for displaying substantially noise-free waveforms, comprising the steps of:

dividing an acquired waveform into a plurality of waveform slices;

categorizing each of said plurality of waveform slices according to at least a sequence of N bit values prior to a bit value being observed;

averaging said waveform slices in each category resulting in an average pattern for each category; and

displaying each of said averaged patterns in an overlayed manner.

2. The method of claim 1, wherein N is in the range of 3-10.

3. The method of claim 2, wherein N = 6.

4. The method of claim 1, wherein each of said waveforms is categorized further according to at least a sequence of P bit values following said bit value being observed.

5. The method of claim 3, wherein P = 1.

6. The method of claim 1, wherein said acquired waveform is stored in memory upon acquisition.

7. The method of claim 1, further comprising the step of obtaining data dependent jitter based upon a peak-to-peak variation of threshold crossing time for a specified vertical threshold.

8. The method of claim 1, further comprising the step of characterizing the eye crossing level by observing a level at which the crossing distribution's peak-to-peak variation is narrowest in said display.

9. The method of claim 8, further comprising the step of re-dividing said acquired waveform into a second plurality of waveform slices in accordance with said obtained data dependent jitter, and substantially corrected for systematic ISI induced jitter and/or noise.

10. The method of claim 9, wherein said second plurality of waveform slices depict a substantially ISI-free jitter component associated with said acquired waveform.

11. An apparatus for displaying substantially noise-free waveforms, comprising the steps of:

means for dividing an acquired waveform into a plurality of waveform slices;

means for categorizing each of said plurality of waveform slices according to at least a sequence of N bit values prior to a bit value being observed;

means for averaging said waveform slices in each category resulting in an average pattern for each category; and

a display for displaying each of said averaged patterns in an overlayed manner.

12. The apparatus of claim 11, wherein N is in the range of 3-10.

13. The apparatus of claim 12, wherein N = 6.

14. The apparatus of claim 11, wherein each of said waveforms is categorized further according to at least a sequence of P bit values following said bit value being observed.

15. The apparatus of claim 14, wherein P = 1.

16. The apparatus of claim 11, wherein said acquired waveform is stored in memory upon acquisition.

17. The apparatus of claim 11, further comprising means for obtaining a data dependent jitter based upon a peak-to-peak variation of threshold crossing time for a specified vertical threshold.

18. The apparatus of claim 11, further comprising means for characterizing the eye crossing level by observing a level at which the crossing distribution's peak-to-peak variation is narrowest in said display.

19. The apparatus of claim 18, further comprising means for re-dividing said acquired waveform into a second plurality of waveform slices at least additionally in accordance with said obtained data dependent jitter, and substantially corrected for systematic ISI induced jitter and/or noise.

20. The apparatus of claim 18, wherein said second plurality of waveform slices depict a substantially ISI-free jitter component associated with said acquired waveform.